PRESERVATION AND PACKAGING STRATEGIES FOR REFRIGERATED MEAT: EFFECTS ON QUALITY, SAFETY, AND SHELF-LIFE

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Abstract

The preservation of refrigerated meat remains a major challenge due to the combined effects of microbial growth, lipid oxidation, and sensory deterioration during storage. In this context, the aim of the present review is to analyze the main preservation and packaging technologies currently applied to refrigerated meat, with emphasis on their effects on food safety, physicochemical stability, shelf-life, and consumer-oriented quality attributes. The paper synthesizes recent literature on conventional packaging systems, particularly vacuum packaging and modified atmosphere packaging, as well as on emerging active and intelligent packaging solutions. Special attention is given to the mechanisms through which these systems influence oxidative processes, microbial development, color stability, texture, and freshness monitoring along the cold chain. The reviewed studies indicate that vacuum packaging and modified atmosphere packaging remain the most widely used strategies, while active packaging based on antioxidants, antimicrobials, and oxygen scavengers, together with intelligent systems using freshness indicators and sensors, represent promising directions for further improvement. The available literature supports the idea that the preservation of refrigerated meat increasingly relies on multifunctional packaging approaches capable of improving product stability, supporting quality monitoring, responding to current industrial and market requirements and avoiding food waste.

Key words: *refrigerated meat, food waste, active and intelligent packaging, shelf-life, food safety*